PATENT ABSTRACTS OF JAPAN

(11)Publication number : 2000-195060

(43)Date of publication of application : 14.07.2000

(51)Int.Cl. G11B 7/007
G11B 19/02
G11B 19/247

(21)Application number : 10-372044

(22)Date of filing : 28.12.1998

(71)Applicant : SAMSUNG YOKOHAMA KENKYUSHO:KK

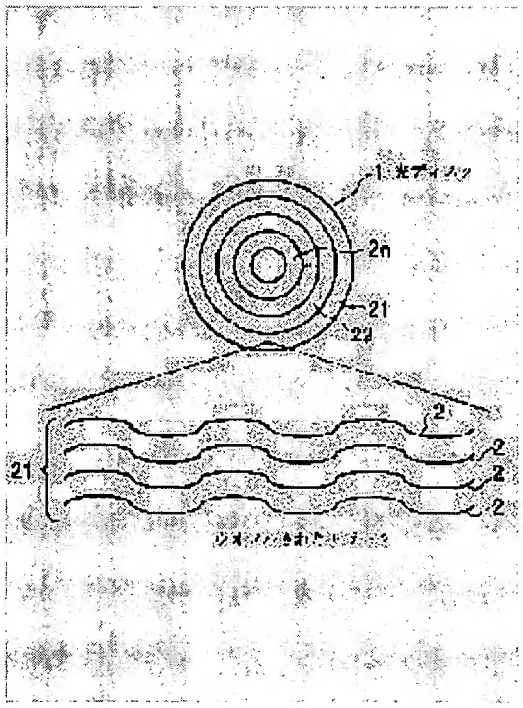
(72)Inventor : AOKI IKUO

(54) OPTICAL DISK AND OPTICAL DISK-DRIVING APPARATUS

(57)Abstract:

PROBLEM TO BE SOLVED: To provide an optical disk having a physical format system which is appropriate to handle data of a large capacity such as image and audio data or the like and can easily secure compatibility to a read-only type optical disk.

SOLUTION: An optical disk 1 is a reload type optical disk such as a phase change medium, an MO(magneto-optic) medium or the like, or a write-once type optical disk such as a pigment-based medium or the like. A physical format of these disks is constituted so that a track 2 is divided to a plurality of zones 21-2n in a radial direction of the optical disk 1. The tracks 2 for recording data are formed to serpentine wobbling with an optional constant cycle set different for each divided zone in the radial direction of the optical disk 1.



LEGAL STATUS

[Date of request for examination]

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]

[Date of final disposal for application]

[Patent number]

[Date of registration]

[Number of appeal against examiner's decision of rejection]

[Date of requesting appeal against examiner's decision of rejection]

[Date of extinction of right]

(19)日本国特許庁（ＪＰ）　(12)公開特許公報（Ａ）　(11)特許出願公開番号
特開2000－195060
（P2000－195060A）
(43)公開日　平成12年７月14日(2000.7.14)

(51)Int.Cl.⁷	識別記号	Ｆ Ｉ		テーマコード（参考）
Ｇ１１Ｂ　7/007		Ｇ１１Ｂ　7/007		５Ｄ０６６
19/02	５０１	19/02	５０１Ｊ	５Ｄ０９０
19/247		19/247	Ｒ	５Ｄ１０９

審査請求　未請求　請求項の数６　ＯＬ　（全７頁）

(21)出願番号　特願平10－372044

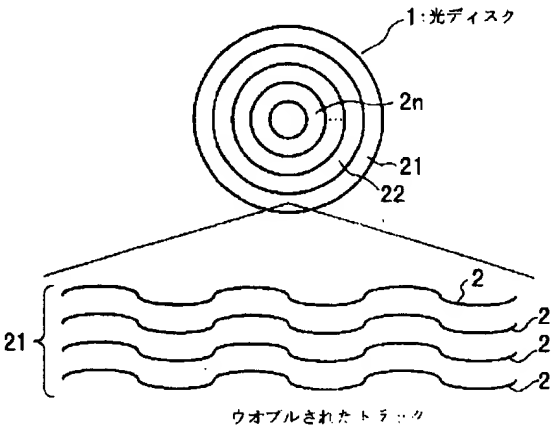
(22)出願日　平成10年12月28日(1998.12.28)

(71)出願人　598045058
株式会社サムスン横浜研究所
神奈川県横浜市鶴見区菅沢町２－７
(72)発明者　青木　育夫
神奈川県横浜市鶴見区菅沢町２－７　株式会社サムスン横浜研究所内
(74)代理人　100064908
弁理士　志賀　正武　（外９名）

Ｆターム(参考)　5D066 DA02
5D090 AA01 BB03 BB05 BB10 CC01
CC04 CC14 DD02 DD05 EE02
GG02 GG03 GG27 HH03 LL07
5D109 KA02 KB06 KD19

(54)【発明の名称】　光ディスク及び光ディスク駆動装置

(57)【要約】
【課題】　画像及び音声データ等の大容量データを扱うのに適し、かつ再生専用型の光ディスクとの互換性を容易に確保できる物理フォーマット形式を有する光ディスクを提供する。
【解決手段】　光ディスク１は、相変化媒体やＭＯ媒体などの書き換え型光ディスク、もしくは色素系媒体などのライトワンス型光ディスクであり、これらの光ディスクの物理フォーマット構成として、トラック２を光ディスク１の半径方向に複数のゾーン21～２ｎに分割する。そして、データを記録するためのトラック２が、光ディスク１の半径方向に対して前記分割された各ゾーン毎に設定の異なる任意の一定周期のウオブルで蛇行するように形成されている。



* NOTICES *

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

CLAIMS

[Claim(s)]
[Claim 1] In optical disks, such as write once optical disks, such as erasable optical disks, such as a phase change medium which has a spiral truck for recording information or reproducing the recorded information, and MO medium, or a pigment system medium The optical disk characterized by forming the truck for dividing said truck into radial [of said optical disk] in two or more zones, and recording data by the wobble of the fixed period of the arbitration from which a setup differs for every [said] divided zone to radial [of said optical disk].
[Claim 2] The inside of each zone at least is an optical disk according to claim 1 characterized by being formed so that the phase of said wobble in said trucks which said wobble is formed under the condition by which the roll control is carried out with the CAV (Constant Angular Velocity) method, and adjoin may carry out abbreviation coincidence.
[Claim 3] The driving means which carries out the rotation drive of the optical disk given in either claim 1 or claim 2, A roll control means to control said driving means to rotate said optical disk at the fixed rotational frequency of arbitration, A frequency detection means to detect the frequency of the wobble signal generated based on the period of the wobble formed a different fixed period for every zone of said optical disk, The optical disk driving gear characterized by having an address detection means to detect the address which pinpoints said zone based on the frequency of the wobble signal detected by said frequency detection means.
[Claim 4] The driving means which carries out the rotation drive of the optical disk given in either claim 1 or claim 2, A frequency detection means to detect the frequency of the wobble signal generated based on the period of the wobble formed a different fixed period for every zone of said optical disk, An engine-speed detection means to detect the engine speed of said driving means, and a roll control means to control said driving means to synchronize said optical disk with the frequency of said wobble signal based on the detection output of said frequency detection means, The optical disk driving gear characterized by having an address detection means to detect the address which pinpoints said zone based on the rotational frequency of the driving means detected by said rotational frequency detection means.
[Claim 5] An optical disk given in either of claims 1 or 2 characterized by recording the address information which pinpoints each zone in the record section of the head of each of said zone in case data are recorded.
[Claim 6] An optical disk given in either of claims 1, 2, and 5 characterized by having the physical format which makes the smallest unit of the file management of record data said zone unit.

[Translation done.]

* NOTICES *

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention] This invention relates to the optical disk and optical disk driving gears using the erasable optical disk which used the phase change medium, MO (optical MAG) medium, etc., or a pigment system medium, such as a postscript (write-once) mold optical disk.
[0002]
[Description of the Prior Art] DVD (digital video disc) is produced commercially as a mass storage to a computer. There is a postscript (write-once) mold optical disk using the erasable optical disk using DVD-ROM (read-only memory) with which a user reads the data memorized beforehand, a phase change medium, MO medium by which a user like DVD-RAM (at any time memory which can be read-out written in) can write in data, etc., the pigment system medium which can write in a one time among the optical disks used for DVD. The configuration of the conventional mold optical disk (DVD-ROM) only for playbacks is shown in drawing 6 . This drawing shows the conventional mold optical disk 50 only for playbacks with which the PURIPITTO train was formed. As the data storage area 52 of the optical disk 50 in this drawing (A) is expanded and it is shown in drawing 6 (B), the PURIPITTO train is arranged in the shape of a straight line at the circumferencial direction of an optical disk 50.
[0003] Thus, the physical format of the conventional mold optical disk only for playbacks with which the PURIPITTO train has been arranged is shown in drawing 7 . This physical format makes the smallest unit of file management one frame (sector), if each frame shows the sector address as address information to that head, it consists of data division (DATA) in which data were written following this ID section, and this frame is continuously formed as a PURIPITTO train over the perimeter of an optical disk 50 (drawing 6).
[0004]
[Problem(s) to be Solved by the Invention] However, the physical formats in the storage region of DVD-RAM and DVD-ROM which were mentioned above differ at the point shown below. In order that DVD-RAM may manage non-assigned space, the ID (Identification) section which shows a sector address is preformatted into the head for every sector. Moreover, in order for DVD-RAM to store data in the both sides of a land truck and a groove truck, this ID section is arranged in the shape of CHIDORI.
[0005] Thus, in order to rewrite data, it is necessary to manage a storage region, and this function manager is added, DVD-RAM has complicated format composition, and physical format configurations differ greatly to DVD-ROM. For this reason, there is no compatibility in the physical format configuration of DVD-ROM and DVD-RAM, and by the optical disk driving gear side which drives an optical disk, detection actuation of the address for reading data etc. needs to correspond so that it can both reproduce.
[0006] It aims at offering the optical disk driving gear which drives optical disks, such as a postscript (write-once) mold optical disk using the erasable optical disk using a phase change medium, MO (optical MAG) medium, etc. of a physical format format which this invention is make in view of such a situation, and are suitable for treating mass data, such as an image and voice data, especially, and can

secure easily compatibility with the optical disk of the mold only for playbacks, or a pigment system medium, and this optical disk.
[0007]
[Means for Solving the Problem] In order to attain the above-mentioned purpose invention according to claim 1 In optical disks, such as write once optical disks, such as erasable optical disks, such as a phase change medium which has a spiral truck for recording information or reproducing the recorded information, and MO medium, or a pigment system medium The truck for dividing said truck into radial [of said optical disk] in two or more zones, and recording data is characterized by being formed by the wobble of the fixed period of the arbitration from which a setup differs for every [said] divided zone to radial [of said optical disk].
[0008] Moreover, invention according to claim 2 is characterized by forming the inside of each zone so that the phase of said wobble in said trucks which said wobble is formed under the condition by which the roll control is carried out with the CAV (Constant Angular Velocity) method, and adjoin may carry out abbreviation coincidence at least in an optical disk according to claim 1.
[0009] Moreover, the driving means to which invention according to claim 3 carries out the rotation drive of the optical disk given in either claim 1 or claim 2, A roll control means to control said driving means to rotate said optical disk at the fixed rotational frequency of arbitration, A frequency detection means to detect the frequency of the wobble signal generated based on the period of the wobble formed for every zone of said optical disk, It is characterized by having an address detection means to detect the address which pinpoints said zone based on the frequency of the wobble signal detected by said frequency detection means.
[0010] Moreover, the driving means to which invention according to claim 4 carries out the rotation drive of the optical disk given in either claim 1 or claim 2, A frequency detection means to detect the frequency of the wobble signal generated based on the period of the wobble formed for every zone of said optical disk, An engine-speed detection means to detect the engine speed of said driving means, and a roll control means to control said driving means to synchronize said optical disk with the frequency of said wobble signal based on the detection output of said frequency detection means, It is characterized by having an address detection means to detect the address which pinpoints said zone based on the rotational frequency of the driving means detected by said rotational frequency detection means.
[0011] Moreover, in case invention according to claim 5 records data on either of claims 1 or 2 in the optical disk of a publication, it is characterized by recording the address information which pinpoints each zone in the record section of the head of each of said zone.
[0012] Moreover, invention according to claim 6 is characterized by having the physical format which makes the smallest unit of the file management of record data said zone unit in an optical disk given in either of claims 1, 2, and 5.
[0013]
[Embodiment of the Invention] Hereafter, the gestalt of operation of this invention is explained to a detail with reference to a drawing. The configuration of the optical disk concerning the gestalt of operation of this invention is shown in drawing 1 . In this drawing, optical disks 1 are write-once mold optical disks, such as erasable optical disks, such as a phase change medium and MO medium, or a pigment system medium. As a physical format configuration of these erasable optical disks and a write-once mold optical disk, a truck 2 is divided into radial [of an optical disk 1] in two or more zones 21-2n.
[0014] And it is formed so that the truck 2 for recording data may lie in a zigzag line with the wave (henceforth a wobble) of the fixed period of the arbitration from which a setup differs for every [said] divided zone to radial [of an optical disk 1]. Suppose that the frequency detected from the information (wobble signal) acquired by the wobble of the fixed period of different arbitration which was formed in the truck, and which was set up for every zone generated when the rotation drive of the optical disk 1 is carried out at a fixed rotational frequency is called a wobble frequency on these specifications here. The wobble of each truck is formed with a predetermined period so that wobble frequencies F1-Fn different, respectively may be detected about the truck which belongs to each zones 21 (Z1)-2n (Zn) as shown in

drawing 2 .
[0015] In addition, although the truck 2 is not illustrated, it is seen record of data, and from [of the light used for playback] incidence, and consists of a land truck (it is hereafter described as a land.) of concave, and a groove truck (it is hereafter described as the groove section.) of a convex.
[0016] Moreover, in case a wobble is formed in an optical disk 1, the inside of each zone at least is formed so that the phase of the wobble in the trucks which a wobble is formed under the condition which is carrying out the roll control of the optical disk with the CAV (Constant Angular Velocity) method by the optical disk driving gear, and adjoin may carry out abbreviation coincidence. Thus, since a fixed track pitch can always secure the land and the groove section of a truck by constituting, the so-called land groove record which records data on a land and the groove section is also realizable.
[0017] The configuration of the optical disk driving gear concerning the gestalt of operation of the 1st of this invention is shown in drawing 3 . The spindle motor 12 with which the optical disk driving gear 10 carries out the rotation drive of the optical disk 1 in this drawing, The spindle motor roll control section 14 which controls the rotational frequency of a spindle motor, The optical head 16 which detects the wobble signal generated based on the wobble recorded on the truck of an optical disk 1, The wobble frequency detector 18 which detects the frequency (wobble frequency) of the wobble signal detected by the optical head 16, and the address which pinpoints a zone from a wobble frequency (it is hereafter described as the zone address.) It has the zone address detection section 20 to detect.
[0018] The zone address detection section 20 has the storage section in which the table showing the relation between the zone address which shows each zone in an optical disk 1, and the wobble frequency which was set up beforehand, and which was set up for every zone was stored, and detects the zone address based on the wobble frequency detected with reference to the table stored in this storage section. The above-mentioned table is obtained by transposing a zone number to the zone address in drawing 2 .
[0019] here -- a spindle motor 12 -- the driving means of this invention -- the optical head 16 and the wobble frequency detector 18 are equivalent to the frequency detection means of this invention, and the zone address detection section 20 is equivalent to the roll control means of this invention for the spindle motor roll control section 14 at an address detection means, respectively.
[0020] In the above-mentioned configuration, a spindle motor 12 carries out the rotation drive of the optical disk 1 under control of the spindle motor roll control section 14. Moreover, the spindle motor roll control section 14 controls a spindle motor 12 to rotate an optical disk 1 at the fixed rotational frequency of arbitration.
[0021] Consequently, the rotation drive of the optical disk 1 is carried out at the fixed engine speed of arbitration, and the wobble signal generated based on the wobble formed the fixed period which changes for every zone of an optical disk 1 with optical heads 16 is detected.
[0022] The wobble frequency detector 18 detects a wobble frequency from the wobble signal detected by the optical head 16. The zone address detection section 20 detects the zone address which pinpoints the zone in which the optical head 16 is located based on the wobble frequency detected from the wobble frequency detector 18 with reference to the table showing the relation between the zone address and the wobble frequency which was set up beforehand, and which was set up for every zone.
[0023] According to the optical disk driving gear concerning the gestalt of this operation, a truck is divided into radial in two or more zones. And the spindle motor 12 with which the truck for recording data carries out the rotation drive of the optical disk 1 currently formed for every [said] divided zone by the wobble of the fixed period of the arbitration from which a setup differs is controlled to become the fixed rotational frequency of arbitration by the spindle motor roll control section 14. a wobble -- a frequency -- detecting -- having made -- since -- the time -- UOPURU -- from -- obtaining -- having -- UOPURU -- a frequency -- naturally -- each -- a zone -- every -- differing -- a sake -- UOPURU -- a frequency -- detecting -- things -- the present light head -- 16 -- or [of optical disk 1 throat / being located in a zone] -- it can know .
[0024] The configuration of the optical disk driving gear concerning the gestalt of operation of the 2nd of this invention is shown in drawing 4 . With the optical disk driving gear which requires the optical disk driving gear concerning the gestalt of this operation for the gestalt of the 1st operation,

constitutionally The frequency of the wobble signal to which differing generates an optical disk 1 at the time of a rotation drive by the wobble by which the spindle motor roll control section 14 is formed in the truck of each zone of an optical disk 1 in the spindle motor 12, Namely, the point controlled to make it synchronize with a wobble frequency and to make it rotate, It has the storage section in which the table showing the relation between the engine-speed detector 30 which detects the engine speed of a spindle motor 12, and the engine speed of the spindle motor 12 at the time of rotating synchronizing with a wobble frequency and the zone address of an optical disk 1 is stored. It is the point of having established a zone address detection means 32 to detect the zone address which pinpoints the zone in which the optical head 16 is located based on the rotational frequency of the spindle motor 12 detected by the rotational frequency detector 30. Since other configurations are the same, the same sign is given to the same element and the overlapping explanation is omitted. The rotational frequency detector 30 is constituted by the encoder etc.

[0025] In the above-mentioned configuration, the rotation drive of the optical disk 1 is carried out by the spindle motor 12 under control of the spindle motor roll control section 14. The wobble frequency detector 18 detects a wobble frequency from the wobble signal detected by the optical head 16. The spindle motor roll control section 14 is controlled to make it synchronize, the frequency, i.e., the wobble frequency, of the wobble signal which generates an optical disk 1 at the time of a rotation drive by the wobble currently formed in the truck of each zone of an optical disk 1 in the spindle motor 12, and to make it rotate. The rotational frequency of the spindle motor 12 corresponding to either of the zone addresses beforehand memorized as a result by the storage section in the zone address detection section 32 will be detected by the rotational frequency detector 30.

[0026] The zone address detection means 32 detects the zone address which pinpoints the zone in which the optical head 16 is located with reference to the table showing the relation between the engine speed of the spindle motor 12 at the time of rotating synchronizing with a wobble frequency based on the engine speed of the spindle motor 12 detected by the engine-speed detector 30, and the zone address of an optical disk 1.

[0027] Thus, since according to the optical disk driving gear concerning the gestalt of this operation the roll control of the spindle motor 12 which carries out the rotation drive of the optical disk 1 is synchronized with UOPURU, it was made to perform it and the rotational frequencies of the spindle motor 12 detected for every zone of an optical disk 1 differ, it can know whether the present light head 16 is located in the zone of optical disk 1 throat by detecting the rotational frequency of a spindle motor 12 with the rotation detector 30.

[0028] That is, according to the gestalt of each above-mentioned implementation, even if it does not form address information in an optical disk by PURIPITTO etc., it becomes possible to be able to detect address information now, consequently to raise the use effectiveness of a format.

[0029] Moreover, if it is made a configuration which records zone address information on the head of each zone together in case data are recorded on the optical disk 1 mentioned above, in the zone where data were recorded once, it can know in which zone the present light head 16 is located using the recorded zone address information. This condition is shown in drawing 5 . Drawing 5 shows the condition that the ID section on which zone address information is recorded, and the data (DATA) section on which data are recorded are prepared in each zone per zone in the optical disk 1. It becomes a configuration similar to the physical format in the very commonsense mold (ROM) disk only for playbacks which exists from the former so that drawing 5 may show. Consequently, it becomes possible to offer the optical disk which has the physical format which can secure easily compatibility with the mold optical disk only for playbacks by using this invention.

[0030] Moreover, what is necessary is just to perform file management per zone, in case data are recorded on the disk formatted in this way. So that especially this may treat mass data, for example, when treating data, such as image & voice, file management becomes easy and it can be said to be a very effective format configuration.

[0031]

[Effect of the Invention] Erasable optical disks which have a spiral truck for according to invention

according to claim 1 recording information or reproducing the recorded information, such as a phase change medium and MO medium, Or it sets to optical disks, such as write once optical disks, such as a pigment system medium. Said truck is divided into radial [of said optical disk] in two or more zones. And since the truck for recording data was formed by the wobble of the fixed period of the arbitration from which a setup differs for every [said] divided zone to radial [of said optical disk] Even if address information etc. is not preformatted, a current light head becomes possible [getting to know the information in which zone in an optical disk it is located, from said UOPURU]. Moreover, as a result, it becomes unnecessary to preformat address information etc. like before, and can consider as the optical disk of very high format use effectiveness, and, naturally a cost cut can also be realized.

[0032] According to invention according to claim 2, it sets to an optical disk according to claim 1. Said wobble is formed at least in each zone under the condition by which the roll control is carried out with the CAV (Constant Angular Velocity) method. And since it was made to be formed so that the phase of said wobble in said adjoining trucks may carry out abbreviation coincidence In all trucks, it can be adapted also for the system which can form a track pitch uniformly, for example, records data on both the land of a truck, and the group section. According to invention according to claim 3, since said optical disk is rotated at the fixed engine speed of arbitration, the frequency of the wobble signal generated based on the wobble formed for said every zone is detected and the zone address which pinpoints said zone with the detected UOPURU frequency was detected, the zone address information of an optical disk is detectable with a very easy configuration.

[0033] Since the address of said zone was detected by synchronizing said optical disk with said wobble frequency, rotating it, and detecting the rotational frequency of the optical disk at that time according to invention according to claim 4, the zone address information of an optical disk is detectable with a very easy configuration.

[0034] Since according to invention according to claim 5 the address information of a zone was recorded on the head of each zone together when recording data, in the zone which recorded data once, the location of the present optical head can be known by reproducing the address information of the zone recorded on the head of each zone.

[0035] In claim 6, since it was made to make the smallest unit of the file management of record data into said zone unit, very easy file management system is realizable. Especially this becomes possible [offering the optimal optical disk format for a system which treats mass data, such as an image and voice data,].

[0036] As mentioned above, the physical format of the optical disk suitable for large capacity-ization can be offered by using this invention.

[Translation done.]

* NOTICES *

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

TECHNICAL FIELD

[Field of the Invention] This invention relates to the optical disk and optical disk driving gears using the erasable optical disk which used the phase change medium, MO (optical MAG) medium, etc., or a pigment system medium, such as a postscript (write-once) mold optical disk.

[Translation done.]

* NOTICES *

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

PRIOR ART

[Description of the Prior Art] DVD (digital video disc) is produced commercially as a mass storage to a computer. There is a postscript (write-once) mold optical disk using the erasable optical disk using DVD-ROM (read-only memory) with which a user reads the data memorized beforehand, a phase change medium, MO medium by which a user like DVD-RAM (at any time memory which can be read-out written in) can write in data, etc., the pigment system medium which can write in a one time among the optical disks used for DVD. The configuration of the conventional mold optical disk (DVD-ROM) only for playbacks is shown in drawing 6 . This drawing shows the conventional mold optical disk 50 only for playbacks with which the PURIPITTO train was formed. As the data storage area 52 of the optical disk 50 in this drawing (A) is expanded and it is shown in drawing 6 (B), the PURIPITTO train is arranged in the shape of a straight line at the circumferencial direction of an optical disk 50.
[0003] Thus, the physical format of the conventional mold optical disk only for playbacks with which the PURIPITTO train has been arranged is shown in drawing 7 . This physical format makes the smallest unit of file management one frame (sector), if each frame shows the sector address as address information to that head, it consists of data division (DATA) in which data were written following this ID section, and this frame is continuously formed as a PURIPITTO train over the perimeter of an optical disk 50 (drawing 6).

[Translation done.]

* NOTICES *

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

EFFECT OF THE INVENTION

[Effect of the Invention] Erasable optical disks which have a spiral truck for according to invention according to claim 1 recording information or reproducing the recorded information, such as a phase change medium and MO medium, Or it sets to optical disks, such as write once optical disks, such as a pigment system medium. Since the truck for dividing said truck into radial [of said optical disk] in two or more zones, and recording data was formed by the wobble of the fixed period of the arbitration from which a setup differs for every [said] divided zone to radial [of said optical disk] Even if address information etc. is not preformatted, a current light head becomes possible [getting to know the information in which zone in an optical disk it is located, from said UOPURU]. Moreover, as a result, it becomes unnecessary to preformat address information etc. like before, and can consider as the optical disk of very high format use effectiveness, and, naturally a cost cut can also be realized.
[0032] Setting to an optical disk according to claim 1 according to invention according to claim 2, the inside of each zone at least is a CAV (Constant Angular Velocity) method. Since it was made to be formed so that the phase of said wobble in said trucks which said wobble is formed under the condition by which the roll control is carried out, and adjoin may carry out abbreviation coincidence, in all trucks, it can be adapted also for the system which can form a track pitch uniformly, for example, records data on both the land of a truck, and the group section. According to invention according to claim 3, since said optical disk is rotated at the fixed engine speed of arbitration, the frequency of the wobble signal generated based on the wobble formed for said every zone is detected and the zone address which pinpoints said zone with the detected UOPURU frequency was detected, the zone address information of an optical disk is detectable with a very easy configuration.
[0033] Since the address of said zone was detected by synchronizing said optical disk with said wobble frequency, rotating it, and detecting the rotational frequency of the optical disk at that time according to invention according to claim 4, the zone address information of an optical disk is detectable with a very easy configuration.
[0034] Since according to invention according to claim 5 the address information of a zone was recorded on the head of each zone together when recording data, in the zone which recorded data once, the location of the present optical head can be known by reproducing the address information of the zone recorded on the head of each zone.
[0035] In claim 6, since it was made to make the smallest unit of the file management of record data into said zone unit, very easy file management system is realizable. Especially this becomes possible [offering the optimal optical disk format for a system which treats mass data, such as an image and voice data,].
[0036] As mentioned above, the physical format of the optical disk suitable for large capacity-ization can be offered by using this invention.

[Translation done.]

* NOTICES *

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] However, the physical formats in the storage region of DVD-RAM and DVD-ROM which were mentioned above differ at the point shown below. In order that DVD-RAM may manage non-assigned space, the ID (Identification) section which shows a sector address is preformatted into the head for every sector. Moreover, in order for DVD-RAM to store data in the both sides of a land truck and a groove truck, this ID section is arranged in the shape of CHIDORI.
[0005] Thus, in order to rewrite data, it is necessary to manage a storage region, and this function manager is added, DVD-RAM has complicated format composition, and physical format configurations differ greatly to DVD-ROM. For this reason, there is no compatibility in the physical format configuration of DVD-ROM and DVD-RAM, and by the optical disk driving gear side which drives an optical disk, detection actuation of the address for reading data etc. needs to correspond so that it can both reproduce.
[0006] It aims at offering the optical disk driving gear which drives optical disks, such as a postscript (write-once) mold optical disk using the erasable optical disk using a phase change medium, MO (optical MAG) medium, etc. of a physical format format which this invention is make in view of such a situation, and are suitable for treating mass data, such as an image and voice data, especially, and can secure easily compatibility with the optical disk of the mold only for playbacks, or a pigment system medium, and this optical disk.

[Translation done.]

* NOTICES *

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

MEANS

[Means for Solving the Problem] In order to attain the above-mentioned purpose invention according to claim 1 In optical disks, such as write once optical disks, such as erasable optical disks, such as a phase change medium which has a spiral truck for recording information or reproducing the recorded information, and MO medium, or a pigment system medium The truck for dividing said truck into radial [of said optical disk] in two or more zones, and recording data is characterized by being formed by the wobble of the fixed period of the arbitration from which a setup differs for every [said] divided zone to radial [of said optical disk].
[0008] Moreover, invention according to claim 2 is characterized by forming the inside of each zone so that the phase of said wobble in said trucks which said wobble is formed under the condition by which the roll control is carried out with the CAV (Constant Angular Velocity) method, and adjoin may carry out abbreviation coincidence at least in an optical disk according to claim 1.
[0009] Moreover, the driving means to which invention according to claim 3 carries out the rotation drive of the optical disk given in either claim 1 or claim 2, A roll control means to control said driving means to rotate said optical disk at the fixed rotational frequency of arbitration, A frequency detection means to detect the frequency of the wobble signal generated based on the period of the wobble formed for every zone of said optical disk, It is characterized by having an address detection means to detect the address which pinpoints said zone based on the frequency of the wobble signal detected by said frequency detection means.
[0010] Moreover, the driving means to which invention according to claim 4 carries out the rotation drive of the optical disk given in either claim 1 or claim 2, A frequency detection means to detect the frequency of the wobble signal generated based on the period of the wobble formed for every zone of said optical disk, An engine-speed detection means to detect the engine speed of said driving means, and a roll control means to control said driving means to synchronize said optical disk with the frequency of said wobble signal based on the detection output of said frequency detection means, It is characterized by having an address detection means to detect the address which pinpoints said zone based on the rotational frequency of the driving means detected by said rotational frequency detection means.
[0011] Moreover, in case invention according to claim 5 records data on either of claims 1 or 2 in the optical disk of a publication, it is characterized by recording the address information which pinpoints each zone in the record section of the head of each of said zone.
[0012] Moreover, invention according to claim 6 is characterized by having the physical format which makes the smallest unit of the file management of record data said zone unit in an optical disk given in either of claims 1, 2, and 5.
[0013]
[Embodiment of the Invention] Hereafter, the gestalt of operation of this invention is explained to a detail with reference to a drawing. The configuration of the optical disk concerning the gestalt of operation of this invention is shown in drawing 1 . In this drawing, optical disks 1 are write-once mold optical disks, such as erasable optical disks, such as a phase change medium and MO medium, or a pigment system medium. As a physical format configuration of these erasable optical disks and a write-

once mold optical disk, a truck 2 is divided into radial [of an optical disk 1] in two or more zones 21-2n.

[0014] And it is formed so that the truck 2 for recording data may lie in a zigzag line with the wave (henceforth a wobble) of the fixed period of the arbitration from which a setup differs for every [said] divided zone to radial [of an optical disk 1]. Suppose that the frequency detected from the information (wobble signal) acquired by the wobble of the fixed period of different arbitration which was formed in the truck, and which was set up for every zone generated when the rotation drive of the optical disk 1 is carried out at a fixed rotational frequency is called a wobble frequency on these specifications here. The wobble of each truck is formed with a predetermined period so that wobble frequencies F1-Fn different, respectively may be detected about the truck which belongs to each zones 21 (Z1)-2n (Zn) as shown in drawing 2 .

[0015] In addition, although the truck 2 is not illustrated, it is seen record of data, and from [of the light used for playback] incidence, and consists of a land truck (it is hereafter described as a land.) of concave, and a groove truck (it is hereafter described as the groove section.) of a convex.

[0016] Moreover, in case a wobble is formed in an optical disk 1, the inside of each zone at least is formed so that the phase of the wobble in the trucks which a wobble is formed under the condition which is carrying out the roll control of the optical disk with the CAV (Constant Angular Velocity) method by the optical disk driving gear, and adjoin may carry out abbreviation coincidence. Thus, since a fixed track pitch can always secure the land and the groove section of a truck by constituting, the so-called land groove record which records data on a land and the groove section is also realizable.

[0017] The configuration of the optical disk driving gear concerning the gestalt of operation of the 1st of this invention is shown in drawing 3 . The spindle motor 12 with which the optical disk driving gear 10 carries out the rotation drive of the optical disk 1 in this drawing, The spindle motor roll control section 14 which controls the rotational frequency of a spindle motor, The optical head 16 which detects the wobble signal generated based on the wobble recorded on the truck of an optical disk 1, The wobble frequency detector 18 which detects the frequency (wobble frequency) of the wobble signal detected by the optical head 16, and the address which pinpoints a zone from a wobble frequency (it is hereafter described as the zone address.) It has the zone address detection section 20 to detect.

[0018] The zone address detection section 20 has the storage section in which the table showing the relation between the zone address which shows each zone in an optical disk 1, and the wobble frequency which was set up beforehand, and which was set up for every zone was stored, and detects the zone address based on the wobble frequency detected with reference to the table stored in this storage section. The above-mentioned table is obtained by transposing a zone number to the zone address in drawing 2 .

[0019] here -- a spindle motor 12 -- the driving means of this invention -- the optical head 16 and the wobble frequency detector 18 are equivalent to the frequency detection means of this invention, and the zone address detection section 20 is equivalent to the roll control means of this invention for the spindle motor roll control section 14 at an address detection means, respectively.

[0020] In the above-mentioned configuration, a spindle motor 12 carries out the rotation drive of the optical disk 1 under control of the spindle motor roll control section 14. Moreover, the spindle motor roll control section 14 controls a spindle motor 12 to rotate an optical disk 1 at the fixed rotational frequency of arbitration.

[0021] Consequently, the rotation drive of the optical disk 1 is carried out at the fixed engine speed of arbitration, and the wobble signal generated based on the wobble formed the fixed period which changes for every zone of an optical disk 1 with optical heads 16 is detected.

[0022] The wobble frequency detector 18 detects a wobble frequency from the wobble signal detected by the optical head 16. The zone address detection section 20 detects the zone address which pinpoints the zone in which the optical head 16 is located based on the wobble frequency detected from the wobble frequency detector 18 with reference to the table showing the relation between the zone address and the wobble frequency which was set up beforehand, and which was set up for every zone.

[0023] According to the optical disk driving gear concerning the gestalt of this operation, a truck is divided into radial in two or more zones. And the spindle motor 12 with which the truck for recording

data carries out the rotation drive of the optical disk 1 currently formed for every [said] divided zone by the wobble of the fixed period of the arbitration from which a setup differs is controlled to become the fixed rotational frequency of arbitration by the spindle motor roll control section 14. a wobble -- a frequency -- detecting -- having made -- since -- the time -- UOPURU -- from -- obtaining -- having -- UOPURU -- a frequency -- naturally -- each -- a zone -- every -- differing -- a sake -- UOPURU -- a frequency -- detecting -- things -- the present light head -- 16 -- or [of optical disk 1 throat / being located in a zone] -- it can know .

[0024] The configuration of the optical disk driving gear concerning the gestalt of operation of the 2nd of this invention is shown in drawing 4 . With the optical disk driving gear which requires the optical disk driving gear concerning the gestalt of this operation for the gestalt of the 1st operation, constitutionally The frequency of the wobble signal to which differing generates an optical disk 1 at the time of a rotation drive by the wobble by which the spindle motor roll control section 14 is formed in the truck of each zone of an optical disk 1 in the spindle motor 12, Namely, the point controlled to make it synchronize with a wobble frequency and to make it rotate, It has the storage section in which the table showing the relation between the engine-speed detector 30 which detects the engine speed of a spindle motor 12, and the engine speed of the spindle motor 12 at the time of rotating synchronizing with a wobble frequency and the zone address of an optical disk 1 is stored. It is the point of having established a zone address detection means 32 to detect the zone address which pinpoints the zone in which the optical head 16 is located based on the rotational frequency of the spindle motor 12 detected by the rotational frequency detector 30. Since other configurations are the same, the same sign is given to the same element and the overlapping explanation is omitted. The rotational frequency detector 30 is constituted by the encoder etc.

[0025] In the above-mentioned configuration, the rotation drive of the optical disk 1 is carried out by the spindle motor 12 under control of the spindle motor roll control section 14. The wobble frequency detector 18 detects a wobble frequency from the wobble signal detected by the optical head 16. The spindle motor roll control section 14 is controlled to make it synchronize, the frequency, i.e., the wobble frequency, of the wobble signal which generates an optical disk 1 at the time of a rotation drive by the wobble currently formed in the truck of each zone of an optical disk 1 in the spindle motor 12, and to make it rotate. The rotational frequency of the spindle motor 12 corresponding to either of the zone addresses beforehand memorized as a result by the storage section in the zone address detection section 32 will be detected by the rotational frequency detector 30.

[0026] The zone address detection means 32 detects the zone address which pinpoints the zone in which the optical head 16 is located with reference to the table showing the relation between the engine speed of the spindle motor 12 at the time of rotating synchronizing with a wobble frequency based on the engine speed of the spindle motor 12 detected by the engine-speed detector 30, and the zone address of an optical disk 1.

[0027] Thus, since according to the optical disk driving gear concerning the gestalt of this operation the roll control of the spindle motor 12 which carries out the rotation drive of the optical disk 1 is synchronized with UOPURU, it was made to perform it and the rotational frequencies of the spindle motor 12 detected for every zone of an optical disk 1 differ, it can know whether the present light head 16 is located in the zone of optical disk 1 throat by detecting the rotational frequency of a spindle motor 12 with the rotation detector 30.

[0028] That is, according to the gestalt of each above-mentioned implementation, even if it does not form address information in an optical disk by PURIPITTO etc., it becomes possible to be able to detect address information now, consequently to raise the use effectiveness of a format.

[0029] Moreover, if it is made a configuration which records zone address information on the head of each zone together in case data are recorded on the optical disk 1 mentioned above, in the zone where data were recorded once, it can know in which zone the present light head 16 is located using the recorded zone address information. This condition is shown in drawing 5 . Drawing 5 shows the condition that the ID section on which zone address information is recorded, and the data (DATA) section on which data are recorded are prepared in each zone per zone in the optical disk 1. It becomes a

configuration similar to the physical format in the very commonsense mold (ROM) disk only for playbacks which exists from the former so that drawing 5 may show. Consequently, it becomes possible to offer the optical disk which has the physical format which can secure easily compatibility with the mold optical disk only for playbacks by using this invention.
[0030] Moreover, what is necessary is just to perform file management per zone, in case data are recorded on the disk formatted in this way. So that especially this may treat mass data, for example, when treating data, such as image & voice, file management becomes easy and it can be said to be a very effective format configuration.

[Translation done.]

* NOTICES *

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] The explanatory view showing the configuration of the optical disk concerning the gestalt of operation of this invention.
[Drawing 2] Drawing showing the relation between the zone number which pinpoints each zone of the optical disk in drawing 1 , and the wobble frequency set as each zone.
[Drawing 3] The block diagram showing the configuration of the optical disk driving gear concerning the gestalt of the operation of the 1st of this invention which drives the optical disk shown in drawing 1 .

[Drawing 4] The block diagram showing the configuration of the optical disk driving gear concerning the gestalt of the operation of the 2nd of this invention which drives the optical disk shown in drawing 1 .
[Drawing 5] The explanatory view showing an example of the physical format of the optical disk concerning the gestalt of operation of this invention.
[Drawing 6] The explanatory view showing the configuration of the conventional mold optical disk only for playbacks.
[Drawing 7] The explanatory view showing the physical format of the mold optical disk only for playbacks shown in drawing 6 .
[Description of Notations]
1 Optical Disk
10 Optical Disk Driving Gear
12 Spindle Motor
14 Spindle Motor Roll Control Section
16 Optical Head
18 Wobble Frequency Detector
20 Zone Address Detection Section
30 Rotational Frequency Detector
32 Zone Address Detection Section

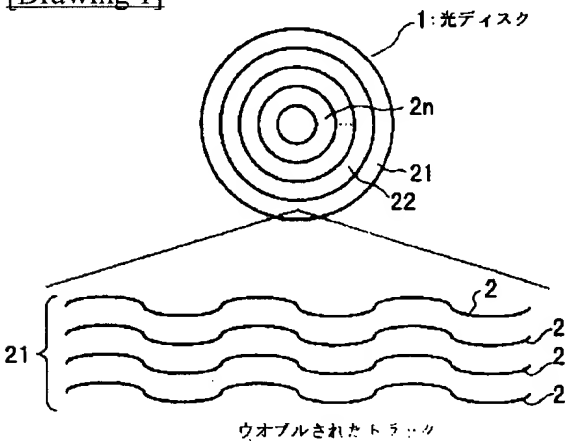
[Translation done.]

* NOTICES *

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

DRAWINGS

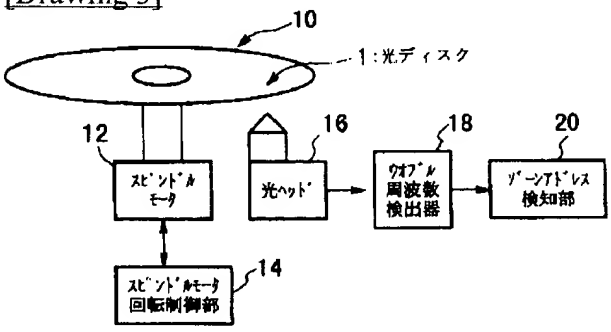
[Drawing 1]



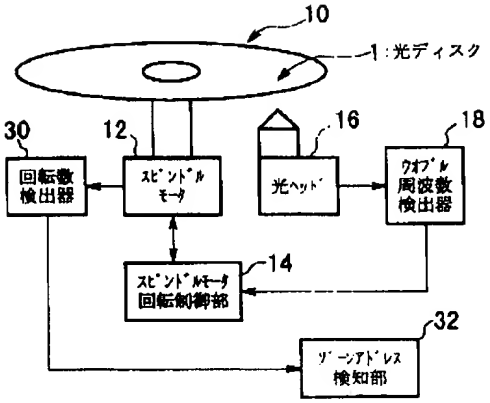
[Drawing 2]

ゾーンナンバー	ウオブル設定周波数
Z1	F1
Z2	F2
Z3	F3
⋮	⋮
Zn	Fn

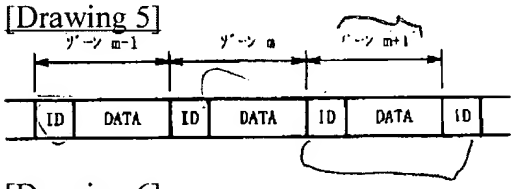
[Drawing 3]



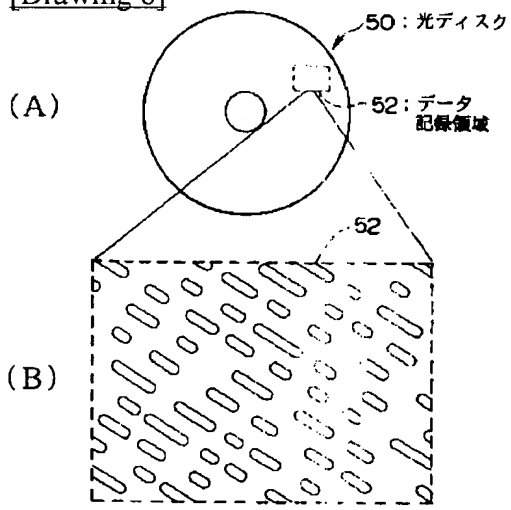
[Drawing 4]



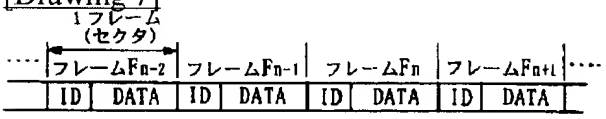
[Drawing 5]



[Drawing 6]



[Drawing 7]



[Translation done.]